



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/374,079 | 08/12/1999 | TRACY D. HARMER | TI-27445 | 3296 |

23494 7590 04/23/2004

TEXAS INSTRUMENTS INCORPORATED
P O BOX 655474, M/S 3999
DALLAS, TX 75265

EXAMINER

BAKER, STEPHEN M

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2133

DATE MAILED: 04/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/374,079

Applicant(s)

HARMER ET AL.

Examiner

Stephen M. Baker

Art Unit

2133

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1, 3, 5 and 6 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,223,321 to Nasu *et al.* ("Nasu").

Nasu discloses distributing ECC processes between floppy disk drive hardware and host software, for ECC processing applied to data in reading from the floppy disk drive. Nasu shows a computer system used with one embodiment of the invention (Fig. 2) including a "host computer" (10) with a "CPU" (13), and a floppy disk drive "mass storage device" (1). Nasu's C1 correction unit (3) provides "ECC hardware associated with said mass storage device". Nasu's host computer (10) requires "software instructions for execution by said CPU for performing at least some ECC instructions on data read from said mass storage device" (col. 8, lines 25-26 and 63-67). Nasu's ECC "software instructions" in the host are part of a device-specific control program for enabling the host computer to work with the floppy disk device, because there is no use for Nasu's ECC "software instructions" in conjunction with any other device coupled to the host computer besides the floppy disk drive. Accordingly, Nasu's ECC "software instructions" in the host are part of a "device driver". For general reference, see the definitions of "driver" in "Computer Dictionary" by Microsoft Press, previously provided by the examiner.

Art Unit: 2133

Regarding claim 3, Nasu's ECC "software instructions" in the host apparently correct the disk data after it is read to main memory (host RAM), as there is no mention of caching the disk data elsewhere.

Regarding claims 5 and 6, in another embodiment of Nasu's invention (Fig. 1) a non-zero C2 syndrome serves as an "error flag" sent to the host (10), apparently for use in host-based ECC processing.

3. Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,252,961 to Hogan ("Hogan").

Hogan discloses distributing ECC processes between disk drive hardware and host software, for ECC processing applied to data in reading from the disk drive (col. 1, lines 63-65). The disk drive can be a hard drive (col. 1, lines 20 and 50). Hogan shows a computer system including a "host computer" (14) with a "CPU", and a hard disk drive "mass storage device" (16). Hogan's hard disk drive provides "ECC hardware associated with said mass storage device" (co. 4, lines 66+). Hogan's host computer (14) requires "software instructions for execution by said CPU for performing at least some ECC instructions on data read from said mass storage device" (col. 3, lines 23-24). Hogan's ECC "software instructions" in the host are part of a device-specific control program for enabling the host computer to work with the floppy disk device, because there is no use for Hogan's ECC "software instructions" in conjunction with any other device coupled to the host computer besides the floppy disk drive. Accordingly, Hogan's ECC "software instructions" in the host are part of a "device driver". For

Art Unit: 2133

general reference, see the definitions of "driver" in "Computer Dictionary" by Microsoft Press, previously provided by the examiner.

Regarding claim 3, Hogan's host (14) presumably corrects the data in host RAM, as there is no mention of caching the disk data elsewhere.

Claim Rejections - 35 USC § 103

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nasu in view of U.S. Patent No. 4,413,339 to Riggle *et al* (hereafter Riggle).

Nasu doesn't specify hardware-based ECC encoding ("data integrity determination information") the disk drive data, although hardware-based ECC decoding (3) is provided.

The hardware-sharing advantage of using a hardware-based ECC encoder within a combined hardware-based encoder/decoder (*i.e.* using codec hardware) where a hardware-based ECC decoder is already required was well known at the time the invention was made, as evidenced by Riggle. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide Nasu's system with hardware-based ECC encoding for the disk drive. Such a provision would have been obvious because the hardware-sharing advantage of using codec hardware for required ECC encoding where a hardware-based ECC decoder is already called for was already well known, as evidenced by Riggle.

Art Unit: 2133

5. Claims 7-9, 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nasu in view of U.S. Patent No. 4,486,827 to Shima (hereafter Shima).

Regarding claims 7-9, Nasu doesn't mention whether the host's floppy disk data ECC decoding "software instructions" are in "system BIOS" memory. Shima shows that placing the code for a disk driver in "system BIOS" memory was well known and conventional at the time the invention was made. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to implement Nasu's disk data ECC decoding "software instructions" for the host in system BIOS. Such an implementation would have been obvious because Shima shows that placing a disk driver in system BIOS memory was already well known and conventional.

Regarding claim 10, a driver "expansion" in comparison with Nasu's prior art (Fig. 3) driver requirements is apparently required.

Regarding claim 12, in another embodiment (Fig. 1) a non-zero C2 syndrome serves as an "error flag" sent to the host (10).

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hogan in view of U.S. Patent No. 5,831,954 to Sako *et al* (hereafter Sako).

Regarding claim 4, Hogan doesn't specifically state that hardware-based ECC encoding ("data integrity determination information") is used for writing to the disk drive, although hardware-based ECC decoding is required.

The hardware-sharing advantage of using a hardware-based ECC encoder within a combined hardware-based encoder/decoder (*i.e.* using codec hardware) where a

Art Unit: 2133

hardware-based ECC decoder is already required was well known at the time the invention was made, as evidenced by the disclosure of Sako. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide Hogan's system with hardware-based ECC encoding for the disk drive. Such a provision would have been obvious because the hardware-sharing advantage of using codec hardware for required ECC encoding where a hardware-based ECC decoder is already called for was already well known, as evidenced by Sako.

7. Claim 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hogan.

Hogan doesn't specify hardware-based error flag generation for indicating to the host that transferred data contains uncorrected errors. Official Notice is given that hardware-based error flag generation for indicating to the host that transferred data contains uncorrected errors was well known at the time the invention was made. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide Hogan's system with hardware-based error flag generation. Such a provision would have been obvious because hardware-based error flag generation for indicating to the host that transferred data contains uncorrected errors was well known.

8. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hogan in view of Shima.

Regarding claims 7-9, Hogan doesn't mention whether the hard disk data ECC decoding "software instructions" are in "system BIOS" memory.

Art Unit: 2133

Shima shows that placing the code for a disk driver in "system BIOS" memory was well known and conventional at the time the invention was made (col. 12, lines 36-42). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to implement Hogan's disk data ECC decoding "software instructions" for the host in system BIOS. Such an implementation would have been obvious because Shima shows that placing a disk driver in system BIOS memory was already well known and conventional.

Double Patenting

9. Claims 1-10 and 12 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-14 of copending Application No. 09/374,081. The differences between the claims in the present application and the copending application are apparently conceptually cosmetic or are conventional in small computer systems.

This is a provisional obviousness-type double patenting rejection.

Response to Arguments

10. Applicant's arguments filed 5 February 2004 have been fully considered but they are not persuasive.

Applicant has, without crediting any source, added "computer-specific instructions" to the definition of a device driver provided by *Computer Dictionary* (Second Edition, Microsoft Press), ostensibly solely on the basis of applicant being able

Art Unit: 2133

to self-ask the in-this-case pointless question: What is 'device specific' software specific to? The examiner believes that added distinction has no impact on the rejections, however. The host-based ECC instructions disclosed by the Hogan and Nasu patents are apparently "computer-specific", in addition to obviously being "device-specific" for the reasons explained in the standing rejections, because the host-based ECC instructions are not described as add-on third-party software, but instead as an integral part of the basic host-device system.

Applicant states that "there is no (sic) indication in Nasu that the C1 correction unit and the C2 syndrome calculator have any connection to the mass storage device. Without such connection, C1 and C2 are not a device driver (sic)", which statement naturally has no relevance to the standing rejections.

Applicant requests that the examiner provide a teaching from the prior art for placing instructions amounting to a "disk driver" in BIOS. The examiner would be willing to state in any form desired by applicant that the idea of reading a disk by means of instructions in BIOS (which clearly serves as "disk driver" instructions in BIOS) was common knowledge known to the examiner for more than one year before the present invention was made, as such an arrangement was understood to be used for the BIOS of the first IBM PCs, as well as in all PCs in general. There is, of course, no other common way to read the disk drive upon start-up other than to use BIOS code.

Applicant states that "(a) BIOS is not seen in Shima". Shima discloses a device driver that is ROM-resident, for reading a floppy disk drive. Shima's device driver ROM is thus apparently a BIOS ROM.

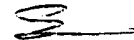
Art Unit: 2133

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. Baker whose telephone number is (703) 305-9681. The examiner can normally be reached on Monday-Friday (11:00 AM - 7:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert DeCady can be reached on (703) 305-9595. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Stephen M. Baker
Primary Examiner
Art Unit 2133

smb